

REMARKS

The Examiner is thanked for the careful review of the application as set forth in the outstanding office action. Reconsideration of the application in view of the foregoing amendments and the following discussion is respectfully requested.

Claims Objections

The objection to Claims 59-60 has been addressed by amending the dependency of Claim 59 to Claim 56.

Allowable Subject Matter

Claims 41-42 are objected to as being dependent on a rejected base claim, but indicated as allowable if rewritten in independent form. These claims have been amended to place them in independent form.

Claims Rejections - 35 USC 102

Claims 40, 43-45, 73 and 76-80 stand rejected as being anticipated by Childers et al. ("Childers"). Applicants respectfully traverse this ground of rejection on the ground that a prima facie case of anticipation has not been established, and the reference does not describe each element of the rejected claims.

The foregoing amendments to Claims 40, 43, 44, and cancellation of Claim 45 moots the rejection of these claims.

Childers does not describe the following exemplary elements:

wherein the nozzles comprising each column of the array are arranged in subgroups of nozzles, each subgroup comprising at least two nozzles, each subgroup fed with liquid ink through a corresponding ink flow path isolated from other nozzles of the array by the barrier layer/orifice structure (Claim 40)

the nozzles comprising each column of the array arranged in subgroups of nozzles, each subgroup comprising at least two nozzles, each subgroup fed with liquid ink through a corresponding ink flow path isolated from other nozzles of the array by the barrier layer/orifice structure, wherein the ink flow path for each nozzle subgroup includes an opening or set of openings through the substrate, and wherein each nozzle of a nozzle subgroup is supplied with ink via said opening or set of openings (Claim 73)

the nozzles comprising each of said plurality of nozzle columns of the array are arranged in subgroups of nozzles, each subgroup comprising at least two nozzles, each subgroup fed with liquid ink through a corresponding ink flow path isolated from other nozzles of the array by the barrier layer/orifice structure (Claim 78)

Applicants respectfully disagree with the Examiner's allegations of the teachings of Childers, and note that the Examiner does not address claim limitations of the rejected claims, including for example those just identified. For example, the Examiner alleges:

Referring to claims 40, 80: wherein the nozzles comprising the array are arranged in subgroups of nozzles, each subgroup comprising at least two nozzles, each subgroup fed with liquid ink through a corresponding ink flow path isolated from other nozzles of the array by the barrier layer/orifice structure, wherein the ink flow path for each nozzle subgroup includes an opening or set of openings through the thin film layer and through the substrate, and wherein each nozzle of a nozzle subgroup is supplied with ink via said opening or set of openings (FIG. 8: the nozzles 820 are grouped in subgroups B,C,M,Y). (Page 4 of the Office Action)

The foregoing discussion does not address the claim limitation that “the nozzles comprising each column of the array are arranged in subgroups of nozzles, each subgroup comprising at least two nozzles” (Claim 40) and corresponding features of Claims 73 and 78.

The rejection under Section 102 should be withdrawn.

Claims Rejections - 35 USC 103

Claims 46-49, 52-53, 55-61, 63-68, 72-75 stand rejected as being unpatentable over Steinfeld et al. (“Steinfeld”) in view of Maeda. The rejection is respectfully traversed on the grounds that a prima facie case of obviousness has not been established and the applied references do not teach or suggest the claimed invention.

Neither reference discloses or suggests structures or methods which include the following exemplary limitations:

a substrate having a surface, and a fluid supply slot formed through the substrate to the surface (Claim 46)

a columnar group of drop generators formed on the surface that are arranged into subgroups each comprising at least two drop generators, each of said subgroups supplied with fluid through the fluid supply slot, each subgroup being fluidically isolated from other subgroups on the surface (Claim 46)

a printhead substrate having a surface on which is formed a columnar group of drop generators that are arranged into subgroups, each of the subgroups including more than one drop generator, one or more fluid feed slots formed through the substrate to provide fluid to the drop generators in the columnar group, the subgroups being fluidically isolated from each other on the surface (Claim 56)

providing a printhead having a substrate surface with a columnar group of drop generators formed on the surface that are arranged into subgroups each comprising more than one drop generator (Claim 65)

feeding the subgroups with fluid through a slot formed through the substrate (Claim 65)

wherein the ink flow path for each nozzle subgroup includes an opening or set of openings through the substrate, and wherein each nozzle of a nozzle subgroup is supplied with ink via said opening or set of openings (Claim 73)

a substrate having an ink feed slot formed therein (Claim 78)

Applicants respectfully disagree with the Examiner's assumptions regarding the teachings of Steinfield. For example, while the Examiner assumes that Steinfield describes ink paths through the substrate, Steinfield states at 9:18-22:

"Fig. 13 also illustrates how ink 88 from the ink reservoir 12 flows through the central slot 52 formed in the print cartridge 10 and flows around the edges 86 of the substrate 28 through ink channels 80 into the vaporization chambers 92 and 94."

The central slot 52 is not formed in the substrate 28.

Maeda does not disclose a substrate having a feed opening or slot formed through the substrate. The nozzles are fed with ink along a top surface of a substrate; the feed path is not described as through a substrate opening or slot.

To establish prima facie obviousness, all claim limitations must be taught or suggested by the prior art. MPEP 2143.03; In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). In regard to the consideration of claims for obviousness, it is well established that "[a]ll words in a claim must be considered

in judging the patentability of that claim against the prior art." In re Wilson, 165 USPQ 494, 496 (CCPA 1970). The rejection should be withdrawn, since all claim limitations are not described by the applied references.

Claims 50-51, 54, 62, 69 and 70-71 stand rejected as being unpatentable over Steinfield in view of Maeda and Allen. This rejection is respectfully traversed on the grounds that a prima facie case of obviousness has not been established, and the applied references do not teach or suggest the claimed invention.

The Examiner alleges that Steinfield as modified by Maeda discloses the claimed invention except wherein the substrate has a plurality of fluid feed holes formed therein to provide fluid to each of the subgroups of drop generators (referring to claims 50, 62, 71), wherein the substrate includes a thin film layer that overlays the fluid feed slot, the thin film layer having openings that couple each of the subgroups to the fluid feed slot (referring to claims 51, 69, 70) and wherein "the thin film layer comprises a plurality of thin film, the thin film layers forming heater resistors in each of the drop generators" (referring to claim 54).

Claims 50-51 and 54 depend from Claim 46 and are allowable for the reasons discussed above regarding Claim 46. Claim 62 depends from Claim 56 and is allowable for the reasons discussed above regarding Claim 56. Claims 69 and 70-71 depend directly or indirectly from Claim 65, and are allowable for the reason discussed above regarding Claim 65. Applicants respectfully disagree that Steinfield as modified discloses the claimed invention except with the noted features, for the reasons discussed above regarding Claims 46, 56 and 65.

Allen is cited as disclosing, among other things, a substrate (FIG. 3A, element 30) having a plurality of fluid feed holes (FIG. 3A, element 32) formed therein to supply fluid to each of the subgroups of drop generators (FIG. 3A, elements 50, 52, 54). The "subgroups" of Allen do not include more than one drop generator or at least two nozzles. Moreover, FIG. 3A discloses a single feed hole 32, not a plurality of fluid feed holes as alleged.

The rejection of Claims 50-51, 54, 62, 69 and 70-71 should be withdrawn.

CONCLUSION

The outstanding rejections have been addressed, and the application is in condition for allowance. Such favorable reconsideration is solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Larry K. Roberts". The signature is fluid and cursive, with the first name "Larry" and last name "Roberts" clearly distinguishable.

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